Treatments of a buffered-saline solution of LSD-25, BOL, or n-Lysergic acid were much higher per gram utilized doses much higher than those used in our experiments. This may be one of the reasons for the difficulty in results. It must be remembered, however, that in every case (including our experiments) the doses administered to the animals were much higher per gram of body weight than those taken by human users. The last statement must not be taken as meaning that the drug should be considered safe to use. Nothing is known about its metabolic fate in Drosophila, and there is a considerable body of information from mammalian systems to cause concern.

Although our data do not show effects of LSD-25 they certainly show effects of the other 2 chemically related compounds. Attempting to make any kind of generalizations and derive definite conclusions from these results should, again, be considered premature. One can state only the obvious and this is that both n-lysergic acid and BOL influence the egg-laying capacity of our experimental animal; the latter compound also appears to exercise a significant influence on egg-to-adult viability among the offspring of the treated individuals. Here again, detailed metabolic studies are needed to determine what is the part of these molecules that creates these effects.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Total No. of flies tested</th>
<th>Total No. of eggs laid</th>
<th>Range</th>
<th>Flies laying (%)</th>
<th>Averages</th>
<th>Adult Emerg.</th>
<th>Adult Emerg.</th>
<th>Not emerging (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline</td>
<td>55</td>
<td>16,820</td>
<td>69-548</td>
<td>3.6</td>
<td>21.8</td>
<td>25.5</td>
<td>0-99</td>
<td>eggs</td>
</tr>
<tr>
<td>LSD-25</td>
<td>56</td>
<td>17,995</td>
<td>68-494</td>
<td>1.8</td>
<td>7.1</td>
<td>35.7</td>
<td>100-199</td>
<td>eggs</td>
</tr>
<tr>
<td>BOL</td>
<td>58</td>
<td>14,626</td>
<td>0-444</td>
<td>5.2</td>
<td>18.9</td>
<td>39.6</td>
<td>200-299</td>
<td>eggs</td>
</tr>
<tr>
<td>Lysergic acid</td>
<td>55</td>
<td>10,897</td>
<td>30-378</td>
<td>7.2</td>
<td>40.0</td>
<td>50.9</td>
<td>300-399</td>
<td>eggs</td>
</tr>
</tbody>
</table>

Summary of data on egg-laying capacity, egg-to-adult viability and sex-ratios of Drosophila pseudoobscura injected with 0.4 µl of a 10 µg/ml of a buffered-saline solution of LSD-25, BOL, or n-Lysergic acid and there is a considerable body of information from mammalian systems to cause concern.

which detected offspring wastages in Drosophila have utilized doses much higher than those used in our experiments. This may be one of the reasons for the difficulty in results. It must be remembered, however, that in every case (including our experiments) the doses administered to the animals were much higher per gram of body weight than those taken by human users. The last statement must not be taken as meaning that the drug should be considered safe to use. Nothing is known about its metabolic fate in Drosophila, and there is a considerable body of information from mammalian systems to cause concern.

Ant Compound Eye: Size-Related Ommatidium Differences Within a Single Wood Ant Nest

The worker population of a red wood ant nest provides a unique opportunity for investigating the effects on behavior of naturally occurring quantitative differences in neural and sensory structures. A relationship has been observed between the size of these workers and the number of components in the compound eye as size increases within the worker population of a single ant nest.

The species is similar in behavior and morphology to Drosophila pseudoobscura, the latter compound also appears to exercise a significant influence on egg-to-adult viability among the offspring of the treated individuals. Here again, detailed metabolic studies are needed to determine what is the part of these molecules that creates these effects.


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Data on buffered-saline injected controls are included.

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Component eyes of Drosophila pseudoobscura have similar genetics, and that worker size is a function of similar genetics, and that worker size is a function of component elements in the visual and other information processing systems. While it is known that the number of components in the compound eye and other sensory and neural structures is greater in larger species of ants and other insects than in smaller related species, we know of no data on such size differences within the worker population of a single ant nest.

The object of the present study was to determine whether such quantitative differences occur in the compound eye as size increases within the worker population of a nest of California red wood ants (Formica integroides). The species is similar in behavior and morphology to the Swiss ants used in the size-efficiency study. The subjects were 67 adult workers taken from collections made in late summer and fall from a single isolated nest, with the selection made to achieve a distribution over the size range.

Three measurements were taken on each ant from standard photographs made of head and eye preparations. These measurements were: 1. a planimetric measure of head surface area (Figure 1 A); 2. the length of the right compound eye (Figure 1A); and 3. the number of component elements in the visual and other information processing systems. While it is known that the number of components in the compound eye and other sensory and neural structures is greater in larger species of ants and other insects than in smaller related species, we know of no data on such size differences within the worker population of a single ant nest.

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of ommatidia in the right compound eye (Figure 1B). The ommatidia were counted from photographs of an impression of the eye made by covering it with a collodion-ether (50:50 v/v) mixture, allowing the mixture to peel away from the surface, and then photographing it with the external surface of the impression facing the objective, using a Leitz Ortholux microscope and point source illumination from below. This method eliminates depth of field problems that are inherent in photographing the eye itself, and it can be used on living and intact specimens.

In addition to these measures, the mean ommatidial lens diameter was determined for a second sample of 20 ants from this population. For these, after the standard head area measure was taken, the right compound eye was excised and a central group of ommatidial lenses photographed. Diameters for each lens were then measured from the photograph, and the mean diameter calculated.

The relationships of these 3 compound eye parameters to head area are shown in Figure 2. It is seen that each parameter increases with head area, and correlation analyses (product-moment correlation coefficient) indicates significant relationships in each case (for ommatidium number, \( r = 0.94 \); for eye length, \( r = 0.92 \); for lens diameter, \( r = 0.84 \); \( p < 0.001 \) in all cases). Visual inspection of the results of a least-squares regression analysis for ommatidium number and eye length (Figures 2, A and B) indicates that the relationships are actually curvilinear, and suggests that these parameters may reach an asymptote at head area values of 1.25 to 1.50 mm².

While we know of no previous data for a single ant nest on relationships between eye component dimensions and size, there is precedent for intra-nest comparisons between gross organ size and total size. Similar curvilinear relationships have been found.

It has been shown previously for insects that both environmental and genetic factors can affect compound eye dimensions. Thus, for Drosophila, it has been found that number of ommatidia can be influenced by temperature conditions during larval growth stages. It is also known for related species of ants, Hymenoptera, and other insects, that as body size increases across species there is correlated increase in the size and number of ommatidia. It has been suggested for these interspecies results that the size correlated increases produce greater sensitivity (larger ommatidia) coupled with